FORRC ENVIRONMENTAL EDUCATION COMMITTEE

"EXPLORE THE GREAT OUTDOORS"

TEACHER WORKSHOPS

GOAL

To create in teachers awareness and appreciation of Red Rock Canyon National Conservation Area which will be passed on to their students, resulting in the protection of RRCNCA.

OUTCOMES

The participants will have the opportunity to:

*Develop an awareness and appreciation of the diverse natural resources of the Red Rock Canyon National Conservation Area.
*Experience meaningful, first-hand activities designed to actively involve students.
*Identify appropriate field trip procedures.
*Become confident and comfortable in their role as leader and facilitator of student field trips to Red Rock Canyon National Conservation Area.

AGENDA

Introduction
Opening
Expectations
Guided Tour of Materials and Resources
Gathering Information on RRCNCA
BREAK - Prepare for "On the Trail"
On the Trail

Lost Creek Trail– Jay Bartos

1. Yucca: shape of leaves guides water, fibers in leaves used
   Bananas, buds and flower stalks eaten eaw/cooked
   Root still used to make shampoo

2. Seas 570-310 mya
   Sea bed rose 225 mya--swamps, streams, rocks of diff colors
   Limestone formed by shells/parts of sea animals (9000 ft)
   (Dinosaurs 250-65 mya)
   Sand dunes began forming about 180 mya: huge area, 1/2 mile
   Sandstone made as dunes fused by rain, heat, snow, chemical reactions--iron oxide and calcium carbonate
   Keystone Thrust 65 mya put limestone over sandstone
   Spring Mts appeared during Keystone Thrust
   Sierra Nevada about 25 mya

   About 10 inches rain per year--most evaporates
   Flash floods from intense rain, hard ground
   Six inches of water at 35 mph, two feet float car

   Water as main agent of change in desert (forms canyons)

3. Manzanita leaves turned sideways, coating on stem protects
   Berries for food (ripe: tea green: jelly)
   Grind seeds for flour--cakes baked in ashes
   Leaves make wash for poison oak, severe colds
   Berries eaten by birds and coyotes
   Seed pass thru squirrel to germinate

   Pinyon pine: midden underneath

4. Pinyon: Nut important to Indians--3,000 calories/pound
   Scout area in Spring--2 years for cycle, 7 year bumper
   Sometime have ceremony to insure good harvest
   Go up in Autumn--time for fun, matchmaking
   Knock down cones with stick, put in fire to open, get nut out, winnow out needles, roast by putting hot coals in with nuts and tossing, crack shells, winnow out shells, roast nutmeats
   Clean out nuts by making paste and pressing into basket, make flour and then gruel
   4 people in 4 weeks enough for 4 months

   Pinyon jay: detaches cones, knocks out nuts brown or tan
   Blue-grey, member of crow family
   Brown has nut--tan not, so bird ignores
   Might test by weighing or clicking bill on
   Take to nesting area, 20 in esophagus
   Hide nuts in underbrush for later--provide shade and

moisture necessary for seed to germinate
Seed is wingless and needs animal help

5. Utah Juniper: called cedar by pioneers
Bark used for diapers, leggings, binding
Berries available through year--dried, ground, into cakes
Worn by Navaho kids to ward off ghosts
Used to flavor gin
Eat inner bark if necessary
Mistletoe sucks nutrients from tree--root into vascular system--seed from berry passes through bird gut

6. Iron concretions on boulder: molecules of iron, circular shape--stone weathers around them--Indian marbles

Lichen: algae and fungus: symbiotic or fungus captures
Fungus (visible) provides home and shelter
Algae, thru photosynthesis, feed fungus
Crustose in desert, provides dye for weavers
Indicator species, food for insects and mice, wear rock

7. Agave: 15 foot high stalk in 30 days, 5 to 35 years, dies but may produce daughter plants from roots
65,000 seeds--one or two will germinate
Bighorn sheep chew when stalk small
Indians roast young stalk, heart for two days, eat flowers boiled or dry
Heat changes chemical composition

Needs limestone in soil, provides calcium
Store moisture in leaves, leaves coated to cut down on evaporation and reflect heat
Absorb CO2 at night to photosyn during day

8. Rock shelter shows simple housing needs--location
Travel large area for food--small bands, related
Hunt rabbits (most important), mice, snakes, tortoises
Dead falls, snares, rabbit drives on flat land
Jack rabbits don't burrow--flee
Water sources taken by settlers (listen for water)

Prickly pear: stores water, green trunk, needles to protect and direct wind for cooling
In drought will drop segments
Tuna (fruit) eaten by Indians, settlers, tortoises
Segments protected by oxalic acid— only wood rats eat
Shallow broad root system
Pads as poultice for wounds

9. Wild grapevines, horsetail--back to before dinosaurs
Lots for animal to eat

Antelope ground squirrel: active during day--maybe a minute
Gets hot, goes into escape burrow, salivates on self
Eat vegetation in place, take seeds back
Named for white tail (pronghorn antelope)

Kangaroo Rat: active at night, runs/hops like kangaroo, long tail to keep balance--leap up to two feet--move quickly out of harms way
Stays in burrow during day with entrances plugged to keep moisture in to keep cool and germinate seeds--burrows may take several years to build
Metabolize water from seeds--don't drink water--eat green plants during mating--milk is concentrated
Efficient kidneys process urine with little water
Moist burrow--little water loss through nasal passages
Daily torpor when very hot
Large middle ear echo chamber increases hearing--especially for owls and rattlesnakes
Excellent night vision

10. Creek flows from contact spring: water percolates, hits shale--runs into desert and evaporates
Can't drink because of giardia--microorgs worldwide
Habitat for brush mouse--can slip out of tail when caught

People able to live in desert because of sweat--cools body
Loss of one cup of sweat per hour prevents overheating--but easy to lose more in desert
Acclimation doesn't help physiologically
Need to make up through drinking--but can't make up at once--feeling of being full after drinking 1/3 or 1/2 needed
Also lose salts--need to regain by eating or sports drinks
Loss of calcium and other lead to cramps, headaches, fatigue
Best to drink on regular basis, eat something salt
Sweat glands will pull water from blood--thickens blood, heart works harder, pulse up, core body temp goes up
After 10% body weight loss due to water loss permanent damage possible to organs, brain
Bighorn sheep lose 20%, quail 50%

11. Ponderosa pine: normally higher, but in cool area
Very small winged seeds, don't need animals to distribute
Live 500 years or more (smell tree)

Great Basin Big Sage: state plant, not sage used for cooking
Used for diaper rash, tea for colds and stomach problems
Hairy leaves protect from heat, cold, dry winds

Yerba Santa: leaves shaped to avoid heat, coated to cut water

loss--mash leaves to put on cuts, sores and fractures
Tea to fight colds
Chew leaves for refreshing taste

12. Manzanita, sage and tobaccobush together
Manzanita root to make pipes
Use each other for shade

13. Rattlesnakes--Mohave, sidewinder, speckled--11 SW species
Pit vipers--use heat sensors to find prey--behind nostrils
Detect human hand 12 inches away
Also air and ground vibrations, tongue for scent

Folded fangs swing forward, bite, drip venom in wound
Hides behind rock, under bush to ambush prey
Smaller prey dies in 5 minutes, larger is released and tracked--swallowed whole, head first--digests
Eats once a week or so--could go a year between meals

Not quick enough to slither away so must confront foe
To avoid: don't turn over rocks, step over bushes
Mohave 16 times more potent than sidewinder 1% people die
Rattles formed as skin is shed but can't tell age
Cold blooded, so bask in morning evening--avoid heat

Attacked by humans, horses, cattle, deer, coyotes, foxes, wildcats, hawks, eagles, owls, king snakes and others

Plants and Animals of Red Rock Canyon

❑ Great Horned Owl

❑ Desert Tortoise

❑ Collard Lizard

❑ Big Horn Sheep

❑ Western Pipistrelle Bat

❑ Barrel Cactus

❑ Joshua Tree

❑ Prickly Pear Cactus

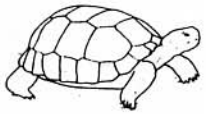
❑ Banana Yucca

❑ Creosote Bush

❑ Mojave Yucca

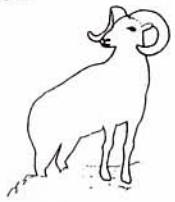
Plants and Animals of Red Rock Canyon

❑ Great Horned Owl



❑ Desert Tortoise

❑ Collard Lizard



❑ Big Horn Sheep

❑ Western Pipistrelle Bat

❑ Barrel Cactus

❑ Joshua Tree

❑ Prickly Pear Cactus

❑ Banana Yucca

❑ Creosote Bush

❑ Mojave Yucca

Red Rock Canyon National Conservation Area

What were your favorite experiences on the field trip?

Name_____

What did you learn on the field trip?

Explore the Great Outdoors Evaluation

Please answer the following questions, we appreciate any input recieved.

1. The most important learning for me in this workshop was:

2. I would have liked to have more information about:

3. My overall feeling about this workshop is:

4. What did I like best about today's session?

5. What might have made the session more effective?